

What is claimed is:

1. A thin film magnetic head including: a first magnetic layer and a second magnetic layer which are magnetically coupled to each other and have two magnetic poles facing each other with a gap layer in between near and in a recording-medium-facing surface to be faced with a recording medium; and a thin film coil provided between the first and second magnetic layers with an insulating layer in between, the first magnetic layer having a predetermined magnetic layer portion including a uniform width portion which extends away from the recording-medium-facing surface and determines a write track width on the recording medium,

wherein the predetermined magnetic layer portion includes a first magnetic film and a second magnetic film which are located apart from and close to the gap layer, respectively, and both the first and second magnetic films are made of a magnetic material having a magnetic flux density of 1.5 tesla or more.

2. A thin film magnetic head according to claim 1, wherein at least one of the first and second magnetic films is made of either an alloy containing at least nickel and iron or iron nitride.

3. A thin film magnetic head according to claim 2, wherein the alloy containing nickel and iron further contains at least cobalt.

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4. A thin film magnetic head according to claim 1, wherein at least one of the first and second magnetic films is made of a material containing an amorphous alloy.

5. A thin film magnetic head according to claim 4, wherein the amorphous alloy is an alloy made of cobalt and iron, an oxide of an alloy made of zirconium, cobalt and iron, or a nitride of an alloy made of zirconium and iron.

6. A thin film magnetic head according to claim 1, wherein the first magnetic film is made of an alloy containing at least nickel, iron and cobalt, and the second magnetic film is made of either an alloy containing at least nickel and iron or an alloy made of cobalt and iron.

7. A thin film magnetic head according to claim 1, wherein an interface between the first and second magnetic films is flat.

8. A thin film magnetic head according to claim 6, wherein an interface between the first and second magnetic films is flat.

9. A thin film magnetic head according to claim 1, wherein a first nonmagnetic layer pattern, which extends in such a manner that the rearward portion thereof is coupled to the insulating layer and the front edge thereof terminates at a predetermined position at the front of the

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recording-medium-facing surface, is provided between the second magnetic layer and the second magnetic film.

10. A thin film magnetic head according to claim 9, wherein the first nonmagnetic layer pattern is made of a nonmagnetic metal.

11. A thin film magnetic head according to claim 8, wherein a first nonmagnetic layer pattern, which extends in such a manner that the rearward portion thereof is coupled to the insulating layer and the front edge thereof terminates at a predetermined position at the front of the recording-medium-facing surface, is provided between the second magnetic layer and the second magnetic film.

12. A thin film magnetic head according to claim 11, wherein the first nonmagnetic layer pattern is made of a nonmagnetic metal.

13. A thin film magnetic head according to claim 10, wherein a second nonmagnetic layer pattern, which extends in such a manner that the rearward portion thereof is coupled to the insulating layer and the front edge thereof terminates rearward with respect to the front edge of the first nonmagnetic layer pattern, is further provided between the first nonmagnetic layer pattern and the second magnetic film.

14. A thin film magnetic head according to claim 13, wherein the

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second magnetic layer has a flat surface, and the first and second nonmagnetic layer patterns are inclined to the flat surface of the second magnetic layer at and near the respective front edges of the first and second nonmagnetic layer patterns.

15. A thin film magnetic head according to claim 12, wherein a second nonmagnetic layer pattern, which extends in such a manner that the rearward portion thereof is coupled to the insulating layer and the front edge thereof terminates rearward with respect to the front edge of the first nonmagnetic layer pattern, is further provided between the first nonmagnetic layer pattern and the second magnetic film.

16. A thin film magnetic head according to claim 15, wherein the second magnetic layer has a flat surface, and the first and second nonmagnetic layer patterns are inclined to the flat surface of the second magnetic layer at and near the respective front edges of the first and second nonmagnetic layer patterns.

17. A thin film magnetic head according to claim 14, wherein the front edge of the first nonmagnetic layer pattern is located in a region in which the uniform width portion of the predetermined magnetic layer portion lies.

18. A thin film magnetic head according to claim 16, wherein the

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front edge of the first nonmagnetic layer pattern is located in a region in which the uniform width portion of the predetermined magnetic layer portion lies.

19. A method of manufacturing a thin film magnetic head including: a first magnetic layer and a second magnetic layer which are magnetically coupled to each other and have two magnetic poles facing each other with a gap layer in between near and in a recording-medium-facing surface to be faced with a recording medium; and a thin film coil provided between the first and second magnetic layers with an insulating layer in between, the first magnetic layer having a predetermined magnetic layer portion including a uniform width portion which extends away from the recording-medium-facing surface and determines a write track width on the recording medium,

wherein the step of forming the predetermined magnetic layer portion includes the steps of:

forming a magnetic material layer;

selectively forming a first magnetic film for constituting one part of the predetermined magnetic layer portion, on the magnetic material layer; and

selectively etching the magnetic material layer by using the first magnetic film as a mask, thereby selectively forming a second magnetic film for constituting the other part of the predetermined magnetic layer portion.

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20. A method of manufacturing a thin film magnetic head according to claim 19, wherein either an alloy containing at least nickel and iron or iron nitride is used as a material of at least one of the first and second magnetic films.

21. A method of manufacturing a thin film magnetic head according to claim 20, wherein an alloy further containing at least cobalt is used as the alloy containing nickel and iron.

22. A method of manufacturing a thin film magnetic head according to claim 19, wherein an amorphous alloy is used as a material of at least one of the first and second magnetic films.

23. A method of manufacturing a thin film magnetic head according to claim 22, wherein an alloy made of cobalt and iron, an oxide of an alloy made of zirconium, cobalt and iron, or a nitride of an alloy made of zirconium and iron is used as the amorphous alloy.

24. A method of manufacturing a thin film magnetic head according to claim 19, wherein either an alloy containing at least nickel and iron or an alloy made of cobalt and iron is used as a material of the magnetic material layer, and an alloy containing at least nickel, iron and cobalt is used as a material of the first magnetic film.

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25. A method of manufacturing a thin film magnetic head according to claim 19, wherein the magnetic material layer is formed by means of sputtering, and the first magnetic film is formed through the growth of a plated film.

26. A method of manufacturing a thin film magnetic head according to claim 24, wherein the magnetic material layer is formed by means of sputtering, and the first magnetic film is formed through the growth of a plated film.

27. A method of manufacturing a thin film magnetic head according to claim 19, wherein the step of etching involves reactive ion etching.

28. A method of manufacturing a thin film magnetic head according to claim 27, wherein the step of etching takes place in a gaseous atmosphere containing a halogen element.

29. A method of manufacturing a thin film magnetic head according to claim 28, wherein the step of etching takes place in a gaseous atmosphere containing at least one of chlorine and boron trichloride.

30. A method of manufacturing a thin film magnetic head

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according to claim 29, wherein the step of etching takes place at a temperature of 50 degrees or higher.

31. A method of manufacturing a thin film magnetic head according to claim 30, wherein the step of etching takes place at a temperature of 90 degrees or higher.

32. A method of manufacturing a thin film magnetic head according to claim 30, wherein the step of etching takes place at a temperature between 50 and 300 degrees inclusive.

33. A method of manufacturing a thin film magnetic head according to claim 26, wherein the step of etching involves reactive ion etching.

34. A method of manufacturing a thin film magnetic head according to claim 33, wherein the step of etching takes place in a gaseous atmosphere containing a halogen element.

35. A method of manufacturing a thin film magnetic head according to claim 34, wherein the step of etching takes place in a gaseous atmosphere containing at least one of chlorine and boron trichloride.

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according to claim 35, wherein the step of etching takes place at a temperature of 50 degrees or higher.

37. A method of manufacturing a thin film magnetic head according to claim 36, wherein the step of etching takes place at a temperature of 90 degrees or higher.

38. A method of manufacturing a thin film magnetic head according to claim 36, wherein the step of etching takes place at a temperature between 50 and 300 degrees inclusive.

39. A method of manufacturing a thin film magnetic head according to claim 19, wherein the step of etching further includes selectively removing the gap layer and the second magnetic layer, except for a region where the uniform width portion of the predetermined magnetic layer portion is formed.

40. A method of manufacturing a thin film magnetic head according to claim 38, wherein the step of etching further includes selectively removing the gap layer and the second magnetic layer, except for a region where the uniform width portion of the predetermined magnetic layer portion is formed.

41. A method of manufacturing a thin film magnetic head

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including: a first magnetic layer and a second magnetic layer which are magnetically coupled to each other and have two magnetic poles facing each other with a gap layer in between near and in a recording-medium-facing surface to be faced with a recording medium; and a thin film coil provided between the first and second magnetic layers with an insulating layer in between, the first magnetic layer having a predetermined magnetic layer portion including a uniform width portion which extends away from the recording-medium-facing surface and determines a write track width on the recording medium,

wherein the step of forming the predetermined magnetic layer portion includes the steps of:

selectively forming a first nonmagnetic layer pattern on the second magnetic layer;

forming the gap layer so as to coat the first nonmagnetic layer pattern and the second magnetic layer around the first nonmagnetic layer pattern;

forming a magnetic material layer on the gap layer;

polishing and flattening a surface of the magnetic material layer;

selectively forming a first magnetic film for constituting one part of the predetermined magnetic layer portion, on the flattened magnetic material layer; and

selectively etching the magnetic material layer by using the first magnetic film as a mask, thereby selectively forming a second magnetic film for constituting the other part of the predetermined magnetic layer

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portion.

42. A method of manufacturing a thin film magnetic head including: a first magnetic layer and a second magnetic layer which are magnetically coupled to each other and have two magnetic poles facing each other with a gap layer in between near and in a recording-medium-facing surface to be faced with a recording medium; and a thin film coil provided between the first and second magnetic layers with an insulating layer in between, the first magnetic layer having a predetermined magnetic layer portion including a uniform width portion which extends away from the recording-medium-facing surface and determines a write track width on the recording medium,

wherein the step of forming the predetermined magnetic layer portion includes the steps of:

forming the gap layer on the second magnetic layer;

selectively forming a first nonmagnetic layer pattern on the gap layer;

selectively forming a magnetic material layer so as to coat the first nonmagnetic layer pattern and the gap layer around the first nonmagnetic layer pattern;

polishing and flattening a surface of the magnetic material layer;

forming a first magnetic film for constituting one part of the predetermined magnetic layer portion, on the flattened magnetic material layer; and

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selectively etching the magnetic material layer by using the first magnetic film as a mask, thereby selectively forming a second magnetic film for constituting the other part of the predetermined magnetic layer portion.

43. A method of manufacturing a thin film magnetic head including: a first magnetic layer and a second magnetic layer which are magnetically coupled to each other and have two magnetic poles facing each other with a gap layer in between near and in a recording-medium-facing surface to be faced with a recording medium; and a thin film coil provided between the first and second magnetic layers with an insulating layer in between, the first magnetic layer having a predetermined magnetic layer portion including a uniform width portion which extends away from the recording-medium-facing surface and determines a write track width on the recording medium,

wherein the step of forming the predetermined magnetic layer portion includes the steps of:

selectively forming a first nonmagnetic layer pattern on the second magnetic layer;

forming the gap layer so as to coat the first nonmagnetic layer pattern and the second magnetic layer around the first nonmagnetic layer pattern;

selectively forming a second nonmagnetic layer pattern on a region of the gap layer corresponding to a region where the first nonmagnetic

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layer pattern is located;

forming a magnetic material layer so as to coat the second nonmagnetic layer pattern and the gap layer around the second nonmagnetic layer pattern;

polishing and flattening a surface of the magnetic material layer;

selectively forming a first magnetic film for constituting one part of the predetermined magnetic layer portion, on the flattened magnetic material layer; and

selectively etching the magnetic material layer by using the first magnetic film as a mask, thereby selectively forming a second magnetic film for constituting the other part of the predetermined magnetic layer portion.

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